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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/177,729	10/23/1998	DAVID S. TAUBMAN	10960578-1	3513

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EXAMINER

TRAN, NHAN T

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/177,729	Applicant(s) TAUBMAN, DAVID S.	
	Examiner Nhan T. Tran	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-11, 15-23, 26, 27 and 29-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-11, 15-23, 26, 27, 30, 31, 33, 36 and 37 is/are rejected.
- 7) ☒ Claim(s) 29, 32, 34 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 8-11, 15-23, 26, 27, 30, 31, 33, 36 & 37 have been considered but are moot in view of the new grounds of rejection. The new grounds of rejection are based on previously cited references to Wober et al (US 5,475,769), Acharya (US 6,348,929) and newly cited reference to Adams, Jr. et al (US 5,652,621) in a broadest reasonable interpretation of the Applicant's claimed invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 19 requires "a standard noise model" which cannot be determined since "standard" can change over time. Therefore, the metes and bounds of the claim cannot be ideally ascertained.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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3. Claim 20 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 20 directs to a generic computer but not a specific machine, and the whole process does not include post-computer activities and pre-computer activities. Therefore, the whole process is not a practical application. See MPEP, 2106.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 8, 9, 15-23, 26, 27, 30, 31, 36 & 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Wober et al (US 5,475,769).

Regarding claim 8, Wober discloses a method of processing an input digital image produced by an optical system, the input image (subject image captured by the camera 163) having less than full color information (only one color at each pixel, e.g., either R or G or B) at each of a plurality of pixels (see col. 7, lines 23-65), the method comprising:

accessing an operator (W) including an array of demosaicing weights (e.g., an array of weighting coefficients contained by W as shown in col. 2, lines 18-35 and col. 5, lines 1-65), the values of the weights determined from measured parameters of the optical system (measured parameters are represented by *at least* acquired color values of neighborhood pixels which are also spectral sensitivity ranges of the individual color filter elements in the mosaic pattern *and/or*

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a mount of lens blurring) and a model of the optical system (this model is represented by the arrangement of color filters R, G & B in mosaic pattern as shown in Figs. 2 & 5). See col. 7, lines 1-22 and col. 5, lines 57-65.

Wober discloses that the operator (W) is applied to the input image to produce an output image having full color information (full R, G & B at each pixel by recovering missing color information) at each of a plurality of pixels (see col. 7, lines 63-65).

Regarding claim 18, this method claim is also met by the analysis of claim 8, wherein a linear operator is represented by W since this set of weighting coefficients is derived from linear equations (col. 5, line 65 – col. 6, line 7 and col. 2, lines 33-35), and accessing a parametric image capture description and measuring parameters of camera are *respectively* represented by the arrangement of color filters in mosaic pattern and the measured parameters, e.g., *at least* acquired color values of neighborhood pixels which are also spectral sensitivity ranges of the individual color filter elements in the mosaic pattern *and/or* a mount of lens blurring.

Regarding claim 19, Wober also discloses a standard noise model (color noise test image) and a linear minimization technique that are used to generate the coefficients (see col. 6, lines 7-34).

Regarding claim 20, Wober further discloses a computer programmed (by virtue of CPU 102) to perform the method of claim 18 (see col. 6, lines 22-25 and flowchart shown in Fig. 6).

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Regarding claim 21, it is clear that the values of demosaicing weighting coefficients are determined to compensate for image degradation (to recover missing color information at each pixel and also to compensate for lens blurring as analyzed in claims 8 & 18).

Regarding claim 22, Wober further discloses that the operator is accessed from a plurality of different operators (see equation (1) in col. 4, equation (5) in col. 5 and col. 7, lines 33-40).

Regarding claim 23, also disclosed is that the operators are included in T-matrices (Transformation matrices) since the data is transformed from pixels with missing color information into pixels having full color information (Wober, col. 4, lines 11-30; col. 5, lines 1-65; col. 7, lines 63-65 and col. 8, lines 23-30).

Regarding claim 26, see the analysis of claim 21.

Regarding claim 27, Wober discloses that measuring the parameters includes measuring color spectral response function (col. 7, lines 14-22).

Regarding claim 30, it is also seen in Wober that the parametric description includes a deterministic part (actual arrangement of color filters in mosaic pattern) and a random part (color noise test image randomly generated shown in Figs. 3 & 5, col. 4, lines 31-38).

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Regarding claim 31, it is also seen in Wober that the deterministic part includes color spectral response function (the arrangement of color filters) as shown in col. 7, lines 14-22.

Regarding claim 36, Wober further discloses an article for a processor (CPU), the article including computer memory with the linear operator of claim 18. See Figs. 5-7, wherein the linear operator is stored in a memory and then used by the processor to interpolate missing colors.

Regarding claim 37, see the analysis of claim 36, wherein a digital camera is 163 (col. 7, lines 23-27).

Regarding claim 9, see the analysis of claim 21.

Regarding claims 15 & 16, see the analyses of claims 36 & 37, respectively.

Regarding claim 17, Wober further discloses a memory for storing a plurality of candidate of operators; and wherein the processor is programmed to access the operator by selecting the operator from one of the plurality of candidates (col. 4, lines 20-28 and col. 7, lines 33-40).

5. Claims 18 & 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Adams, Jr. et al (US 5,652,621).

Regarding claim 18, Adams discloses a method of generating a linear operator for demosaicing of a digital image by a digital camera (see Abstract and Fig. 1), the method comprising:

accessing a parametric image capture description (this is represented by accessing a predefined arrangement of color filters in Bayer pattern or mosaic pattern as shown in col. 1, lines 40-50 and col. 2, lines 59-66, wherein the color arrangement is registered beforehand in the camera for accessing in order for the camera to function as disclosed);

measuring parameters of the camera (this is represented by measuring parameters of each color pixel by virtue of its value to determine classifiers before selecting coefficients for interpolation or demosaicing, see col. 4, lines 40-53; col. 6, lines 1-20 and col. 8, lines 20-25);

using the parametric description and the measured parameters to obtain coefficients of the linear operator (see col. 8, lines 35-55, wherein the linear coefficients are indicated by $\frac{1}{2}$, $\frac{1}{4}$ that are obtained depending on which direction having a stronger correlation based on the classifiers).

Regarding claim 33, it is clear that the coefficients of the linear operator are obtained without the use of measured image samples (i.e., without using a test image). See the analysis of claim 18.

6. Claims 10 & 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wober et al (US 5,475,769) in view of Acharya (US 6,348,929).

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Regarding claim 10, Wober discloses a method of processing an input digital image produced by an optical system as discussed above, but Wober does not clearly disclose the step of applying the operator includes forming of a plurality of input vectors from the input image, each input vector formed from super pixels, and applying the operator to the input vectors. Acharya teaches a scaling algorithm and architecture for scaling an image wherein each input vector is formed from super pixels (col. 4, line 62 – col. 5, line 3 and col. 6, lines 49-60).

Therefore, it would have been obvious to one of ordinary skill in the art to modify Wober to include each input vector that is formed from super pixels in a manner taught by Acharya to provide an output of varying resolution suitable in digital photography.

Regarding claim 11, the combination of Wober and Acharya further includes the operator being used for different resolutions and a resulting fixed resolution image is resampled (see Acharya, col. 6, line 56 – col. 7, line 13).

Allowable Subject Matter

7. Claims 29, 32, 34 & 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (571) 272-7371. The examiner can normally be reached on Monday - Thursday, 7:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NT.


DAVID L. OMETZ
SUPERVISORY PATENT
EXAMINER